Soil Conservation

March 1978

U.S. Department of Agriculture

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More Action for Aquaculture

From the Administrator

Fish farming, a form of aquaculture, is attracting new interest today in the United States and around the world.

Aquaculture so far furnishes only a small part of our protein in this country, but in several nations—even industrialized ones like Japan—it accounts for a significant share. Several developing countries rely on aquaculture for more than half their protein.

There are several reasons for the growing interest in fish farming.

First, the supply of certain species of ocean fish no longer appears to be inexhaustible. Commercial fishing fleets already are reaching the harvestable limits of some species. Yet world demand for fish is expected to double by the year 2000.

Second, fish farming is more energy efficient than other types of animal protein production. The conversion ratio of feed to meat in several forms of commercial fish farming is as high as 1.4:1.

Third, fish farms can be developed on land that is poorly suited for crops. Aquaculture therefore offers an alternative for using marginal cropland without taking it out of food production.

In this country, most commercial fish farming has been limited to two species, trout and catfish. Trout hatcheries and farms in the United States go back more than 100 years; warm water fish culture, including the buffalo fish and catfish, began to catch on about 20 years ago. Commercial catfish farms reached a high of about 60,000 acres in 1974.

Despite recent leveling off of the catfish industry, it is a good bet that we have seen only the beginning of fish farming in this country. The Food and Agriculture Act of 1977 included aquaculture as "a basic function" of USDA, and new bills now before Congress would accelerate fish farming development. There also is more interest in aquaculture in the scientific community.

As one USDA agency that assists fish farmers, the Soil Conservation Service has an interest in the orderly growth of the industry. Our field people help farmers assess the potential of their resources for growing and marketing fish. Those who have the right combination of resources can receive additional help from SCS in designing ponds, detention structures, raceways, and other features.

Two SCS booklets on aquaculture—*Trout Farming* and *Catfish Farming*—continue to enjoy wide circulation, evidence that many Americans share our agency's interest in the subject. We believe that strong SCS technical assistance to fish farmers will contribute much to proper growth of the industry. At the same time, our work with aquaculture helps assure the wise use and conservation treatment of still more of the Nation's land and water resources.

Mel Davis

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Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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Cover:
One conservation practice that increased in usage during fiscal year 1977 is minimum tillage. For the annual report of SCS activities, see pages 17 through 22. (Photo, Earl R. Baker.)

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Pine City students study wildlife habitat firsthand at one of their outdoor learning sites.

Students Learn at the Gravel Pit and Beyond

In east-central Minnesota, school districts work together to bring environmental education to 10,000 students.

by Konval H. Bergum

Ten years ago, outdoor environmental education in Pine County, Minn., began primarily with two schools. Fifth and sixth grade students at Hinckley and Pine City schools were bused to a study site where representatives of various agencies presented hour-long classes on conservation.

Today, all schools in Pine County and neighboring Chisago County have their own outdoor learning sites and have included environmental education in their curriculums.

The 10 school districts in the two counties formed an environmental education consortium. Each district has a teacher who is designated as environmental education coordinator. An environmental education steering committee works with other teachers and resource agencies.

The consortium is funded through a 3-year, $90,000 grant from the Minnesota Department of Education's Council on Quality Education. The 10 districts—Askov, Finlayson, Hinckley, Pine City, Sandstone, and Willow River in Pine County; and Chisago Lakes, North Branch, Rush City, and Taylors Falls in Chisago County—were already cooperating in other subjects. In 1975, they decided to apply for the grant to coordinate environmental education programs.

"The superintendents wanted to improve environmental education for all 10,000 students in the 10 districts," said Project Director Howard Teague.

A swampy section of Pine City's Natural Area gives students a close look at wetland habitat.

Students help develop their outdoor sites with activities such as tree planting.

The first step, once the consortium was organized more than 2 years ago, was to determine what assistance the area's 445 teachers needed to conduct environmental education in their classes. Once the teachers' needs were identified, the consortium worked district by district to meet them.

One tool that was developed for the teachers is the "Environmental Education Planning Guide." It describes environmental learning goals for students at each grade level and suggests more than 100 activities that can be carried out with classes in almost all subjects—from science and social studies to music and math.

The guide also has maps of each school's outdoor learning site, important historic and geologic information, and lists of individuals and agencies to contact for assistance in teaching environmental education.

"The guide is the product of ideas from more than 400 teachers," noted Teague.

Soil information is being furnished on all school sites in Pine County by the Soil Conservation Service.

Pine City was a leader in environmental education, having developed two outdoor learning sites before the consortium was formed. In 1971, the Pine City schools obtained an abandoned 72-acre gravel pit that had provided highway construction material. Area residents considered the gravel pit an eyesore. But when the hole began filling with water, they thought it might have potential for wildlife habitat and for students to learn firsthand about the outdoors.

The Pine City School Board selected a committee that included the natural resource agencies in Pine County to plan the use of the area and named Dave Trampe, Pine City vocational-agriculture instructor, committee chairman. Working through the Pine County Soil and Water Conservation District, SCS mapped the soils of the area and worked with students in vocational agriculture classes to develop a conservation plan. Funds from many sources were used to carry out the plan.

One objective of the plan was to make the site natural looking. The rough side slopes of the gravel pit were smoothed and leveled. In addition, several ponds with islands are being built on the site. The plan also called for prairie development, tree planting, wetland development, and wildlife food plots. About 1 acre is being left to return to its natural state.

"Pine City's second outdoor learning site is a unique area," observed Jane Hill, Pine City elementary teacher and environmental education coordinator. "It has about 8 acres of virgin hardwood which have never been pastured. The remainder of the area is swampy with open, shallow water or open meadow. We've identified many types of wild flowers and plants."

The teachers and students want to leave the 35-acre site as a natural area. The few necessary trails and observation points will be located in such a way as to cause a minimum of destruction while students are studying.

"Many of the faculty and students are involved in the planning process, and we want all teachers and students to feel at home on the site and use it," Hill stated.

The consortium, which is under the direction of the superintendent and one school board member from each of the 10 school districts, has secured a $25,000 Comprehensive Employment and Training Act grant to develop trails and make other improvements at Pine City and seven other school-owned outdoor learning areas—some 1,900 acres of land. The schools in the consortium are sharing skis, snowshoes, soil augers, and other outdoor learning tools.

"By being in the consortium, the schools have participated in 3 years of intensive production of ideas and materials. Now, the individual school districts have an environmental education program they can carry out on their own or with other districts once the funding from the Council on Quality Education runs out," said Teague.

Mr. Bergum is district conservationist, SCS, Hinckley, Minn.

New System Controls Dairy Waste

A winding waterway leads to better waste management on a dairy farm east of Lincoln, Nebr.

by Marvin D. Keebler
and Willard F. Jones

A long, grassed waterway snaking downslope from a loafing shed, feed bunk, and cow lot is the key to dairyman John Ronhovde's new waste management system.

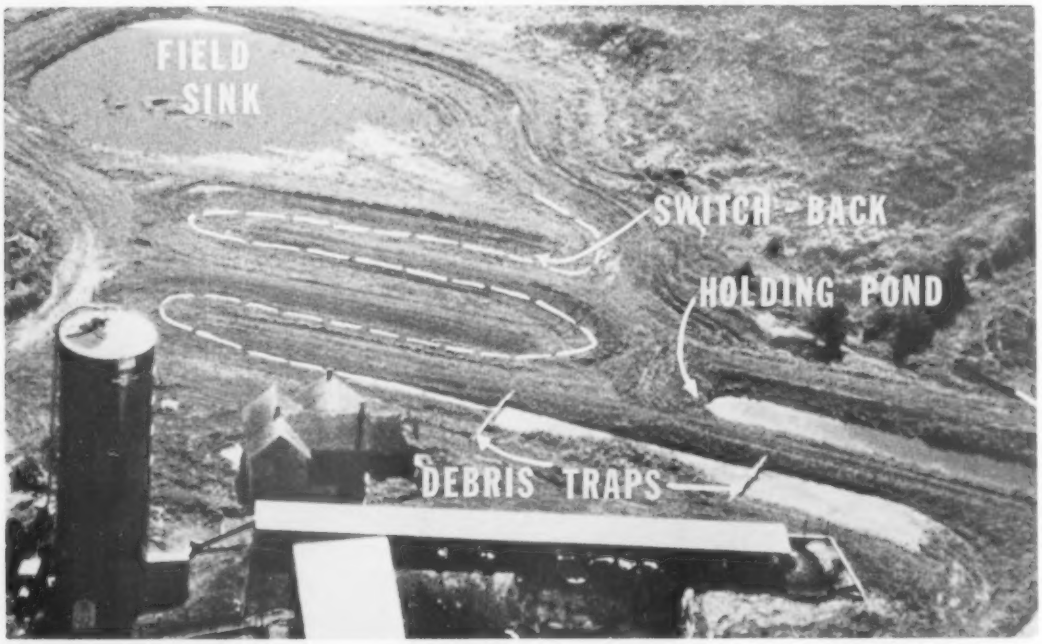
The gravity serpentine, or switchback, waterway is about 600 feet long and 15 feet wide along its bottom. Its slope ranges from 0.4 to 2 percent, following the natural slope of the land.

Runoff and liquid waste not absorbed before reaching the end of the waterway flow into a 1-acre field sink, where they evaporate or seep into the soil. The field sink also holds excess runoff from heavy rains.

The system includes a debris basin at the head of the waterway. Two screens in the basin trap solids carried by storm runoff from the confinement lot.

Washwater from the milking parlor drains through a buried pipe into a holding pond that can collect 800 gallons a day for 120 days. The holding pond's outlet drain is unique. It is a plastic pipe that contains a plastic orifice plate. A rubber toilet plunger covers the hole. The plunger's wooden handle, encased in a riser, extends to the top of the pond

At left, Ronhovde's dairy waste facility consists of a debris basin with screens to trap solids (left), a holding pond with capacity for 120 days' washwater from the milking parlor (right foreground), and a field sink (right background). As seen from the air (below), a grassed waterway winds its way between the debris basin and field sink.



—courtesy, University of Nebraska.

embankment. With the handle, the rubber cup can be lifted off the opening to allow the stored liquid to drain out through the lower half of the waterway and into the field sink.

The system is self-contained. Clean runoff is diverted from the polluted areas and into a nearby creek.

"The system seems to be working okay," said Ronhovde. "We also need to build a manure storage bin on a concrete slab for easier handling and disposal of solid waste."

Currently, manure is scraped from the barn floors and confinement lot and hauled directly to fields of milo, corn, wheat, and alfalfa, where it is spread as fertilizer. The storage bin will help keep manure from accumulating in the buildings and on the lot when weather does not permit spreading.

"The one problem we have is that the seepage in the field sink is slower than we thought it would be because the liquid tends to concentrate at one end. We may grade the sink so that it has a level bottom," Ronhovde added.

Ronhovde requested an inspection of his dairy, and in summer 1976 received a notice from the Nebraska Department of Environmental control that the operation required a livestock waste control system.

"We were concerned about stream pollution because our dairy is right on the banks of Nemaha Creek. We expanded our herd from 70 to 110 cows during the past 2 years and paved our cow lot, which increased runoff.

"We originally thought about just installing a dike to keep runoff from entering the creek," said Ronhovde, a cooperator with the Nemaha Natural Resources District for 30 years. He also considered other waste disposal systems, but they were too expensive.

Through the district, the Soil Conservation Service made a topographical survey of the confinement lot, buildings, and the area below and drew up a plan for the waste control system. Engineers from the University of Nebraska Cooperative Extension Service and the Agricultural Research Service contributed design features and ideas.

Ronhovde accepted the plan and found that the project qualified for financial assistance from the Agricultural Stabilization and Conservation Service through the Agricultural Conservation Program. His outlay was less than $2,000 of the total $4,000 cost.

"The biggest advantage of the system was that we were able to use our present solid waste removal equipment and avoid additional investments," said Ronhovde. "The profit in the dairy business these days isn't enough to warrant very big expenditures."

Mr. Keebler is area engineer, SCS, Lincoln, Nebr.
Mr. Jones was a soil conservationist, SCS, Lincoln, Nebr., and is now retired.

A watercourse once choked with silt, debris, and vegetation now provides youngsters with a place to fish.

by Katherine C. Gugulis

Tax Ditch Cleanup

Farmers and "city folks" join together to clean out a pre-Revolutionary tax ditch—and solve a common problem.

In Dover, Del., a 4-mile-long water removal system solves both rural and urban natural resource problems.

Called a "tax ditch" because adjacent landowners are assessed for its maintenance, the watercourse drains about 2,100 acres, including two housing developments, a low-income housing project, two city parks, and several farms.

Although the ditch dates back to colonial times, it was last cleaned by the Civilian Conservation Corps in the late 1930's. Since then, it had become clogged with silt and debris and overgrown with phragmites, a common marsh plant. Recent urban development had increased the amount of runoff, which topped the low banks and flooded yards and cropland after every rain.

"When we annexed this area to the city of Dover, we annexed a lot of problems along with it—and one of the biggest was standing water," said Jack R. Woods, public works director for Dover. "The only way to solve it was to clean out the existing ditch."

However, getting the cooperation of the 17 landowners and several jurisdictions whose property abutted the watercourse was no small feat. In fact, the city's first attempt failed, said Woods.

The rural landowners downstream wanted and needed the water removal system as much as their city neighbors, but they believed that the city should pick up the tab since the development upstream had increased the runoff.

The city turned to the Kent Conservation District, and things began to happen. With technical assistance from the Delaware Division of Soil and Water Conservation and the Soil Con-

One benefit of the cleaned-out tax ditch for farmers is improved soil moisture conditions.

Roland Garrison, chairman of the tax ditch association, explains how he involved his neighbors in the project.

Area residents no longer have soggy yards.

servation Service, the district ran a survey, drew up a property map, and prepared a plan.

Using funds provided by the State and the Kent Levy Court, the district agreed to pay 75 percent of the first construction contract and 50 percent of the second. The city agreed to pay the remaining costs.

"Usually, the tax ditch commissioners take the estimated cost of the project and allocate a certain amount to each landowner. The landowner receives one vote for each dollar he's assessed," explained Fred Mott, SCS district conservationist.

In this case, the landowners were allowed to retain their voting power. That way, the tax ditch is administered by the local people.

According to Mott, much of the project's success was due to Roland Garrison, chairman of the tax ditch association. "Roland was the one who rallied his neighbors to the cause," he said.

"Farmers are always a little suspicious of city boys," Garrison said. "Some of the neighbors would come by and we'd talk about what they might be up to. Mostly, we didn't want the city to dump any more water on us. We finally got together though, and the neighbors realized that cleaning out the ditch would also improve soil moisture conditions on their farms."

After 2 years of planning followed by a public hearing and referendum, the landowners donated permanent rights-of-way and the cleanup started. The finished water removal system cost about $75,000.

Even though the city picked up the local share of that total, the tax ditch was still a bargain, according to Woods. Eventually, the city will recoup its investment in terms of an increased tax base as development expands and land values in the area go up.

The ditch already has made a soggy section of Dover habitable for the city folks and provided the country folks with an outlet for their waterlogged fields.

However, the most rewarding aspect of the project, said Woods, is the outstanding cooperation demonstrated by all the folks and the local, State, and Federal agencies involved.

Ms. Gugulis is public information officer, SCS, College Park, Md.

The Cooch family faces the greatest battle on its farm since the American Revolution.

by Gordon L. Leckie

The Approach at Cooch's Bridge

SCS Soil Conservationist Marianne Hardesty and District Conservationist David Nash inspect new growth on grassed waterway—one measure installed to control sedimentation on the Cooch family farm. At right, Marianne Hardesty checks one of the numerous duck boxes planned to encourage wood ducks to nest on the farm.

Two hundred years ago, the British Army threatened the farm at Cooch's Bridge in northern Delaware. Today, six generations later, Wilmington Attorney Edward Cooch is fighting to protect the New Castle County landmark from another enemy—erosion.

On September 3, 1777, while Colonel Thomas Cooch was away raising funds for the Continental Army, his farm became the site of the only battle of the Revolution to be fought on Delaware soil. After defeating George Washington, General Cornwallis claimed the Cooch house for British headquarters.

Nearly 200 years after the battle, the Cooch family farm claimed another first: it was the first in Delaware to have a Long Term Agreement (LTA) for conservation work that would control erosion and restore the land.

In recent years, the land was farmed by a number of tenants who held short-term leases. Little care was taken to conserve the soil. For example, one field was planted with soybeans up and down the slope. By fall, the field was so eroded that the soybeans couldn't be harvested, and the field was left idle.

Although the farm now is surrounded by advancing urban development, Cooch thinks the location is ideal for agriculture. "The farm is about a mile south of Newark, and

David Nash, SCS district conservationist, reviews conservation plan on the farm at Cooch's Bridge.

there are a lot of people in this corridor from Newark to Wilmington," he said. "They have to eat, and I'm situated in the right place to feed them."

The LTA details a systematic way of restoring the 230-acre farm to productivity. "It's a good arrangement," said Cooch. "In 1974, the Soil Conservation Service helped me develop a conservation plan covering a 5-year period. As long as I live up to my end of the bargain, the Agricultural Stabilization and Conservation Service (ASCS) makes funds available to help the farm recover."

The LTA for Cooch's farm calls for building two grassed waterways, laying tile drains, and establishing a permanent cover of grass and trees in badly eroded areas—measures that are among the best management practices for preventing sedimentation in the area.

"There's no better method than the LTA for getting the job of conservation done," said David Nash, SCS district conservationist for New Castle County. "The first year we had some problems, though," he added.

"We had just finished grading for a 2,000-foot-long grassed waterway through a crop field on the slopes of Iron Hill, a site that was the primary source of the iron used to make Revolutionary muskets. To make sure that runoff would not destroy the grading, Cooch placed rows of hay bales across the waterway at 100-foot intervals to slow the flow of water.

"The very next day, a freak storm dumped an inch of rain on the field, followed by another inch of rain the second day. Even the hay bales washed away.

"We redid the job," Nash recalled, "but this time we added temporary diversion ditches along the edges of the waterway. We also seeded the waterway with a nurse crop of fast-growing rye mixed with Kentucky 31 fescue and tied it down with jute netting. Now the waterway looks like a winding fairway."

Cooch is an active member of Delaware Wildlands, a group dedicated to preserving and developing land for wildlife, and he incorporated wildlife development into his conservation plan.

The LTA calls for building a pond in the corner of a pasture by the woods and for converting nearly 8 acres to trees. To encourage more wood ducks to nest at Cooch's Bridge, duck boxes were nailed to tree trunks from the front lawn through the woods and down to Christiana Creek. The farm also provides food and cover for rabbits, squirrels, quail, and red-tailed hawks.

Cooch said that flexibility is another thing he likes about his LTA. "Sure, we have to meet rigid deadlines," he said, "but if the national economic climate changes, I can shift a pasture to cropland or some other paying venture. The ASCS County Committee has to agree to any change in the plans, though."

According to local legend, Colonel Cooch buried one box of silver and one box of gold under trees on the lawn before General Cornwallis took over his home. The box of silver was found, but no one ever located the gold.

"Conservation work turned up just about everything but gold," said Nash. As a tile drain was being laid in a crop field, for example, a century-old French drain was unearthed. The early conservation measure used field stones to direct drainage water.

"The real treasure we found, however, was the chance to use the LTA to restore the farm at Cooch's Bridge," said Nash.

Mr. Leckie is public information specialist, Northeast Technical Service Center, SCS, Broomall, Pa.

Beating the Heat

A survey crew in Maine modified its equipment and worked at night to overcome a problem of heat waves distorting the line of sight.

by Doris W. Laber

Odds and ends from a hardware store plus a few extra hours on the job at night allowed a Soil Conservation Service survey team to overcome a problem with heat waves. And in the long run this ingenuity and effort helped the team to finish an assignment on Flood Insurance Studies 3 months ahead of schedule.

The U.S. Department of Housing and Urban Development had contracted with SCS in Maine for the field surveys which would be used with hydraulic and hydrologic data to determine flood insurance rates for the towns of Abbot, Guilford, Milo, Dover-Foxcroft, Sebec, and Sangerville.

Equipped with highly sophisticated engineering devices, Ray Herrington, SCS civil engineering technician, and his crew of 10 set out to survey cross sections along the Piscataquis River Valley in north-central Maine. They were to measure distances, slopes, and elevations.

Their equipment included a theodolite (a sophisticated transit), an electronic distance meter (EDM), and the usual targets, rods, and other surveying instruments.

In Maine, the theodolite-EDM equipment is commonly used for vertical and horizontal control surveys for Flood Hazard Analyses, Resource Conservation and Development measures, Public Law 566 projects, and sediment surveys in addition to Flood Insurance Studies.

Using the theodolite with the EDM has an advantage over using basic surveying equipment, according to Herrington. It provides accurate measurements with fewer setups, thus taking less time than more conventional equipment. For example, it might take 2 hours to survey 2 miles of rough terrain with basic equipment, but using the theodolite-EDM it would take 30 minutes.

Also, the theodolite used with the EDM reads to the nearest second and can measure distances up to 2 miles to within one-thousandth of a foot. A basic transit, on the other hand, reading to the nearest minute, can read distances up to only about 500 feet.

Herrington and his crew made a good start on the survey early in the spring of 1976. As summer approached, though, heat waves rising from the pavement and open fields distorted the line of sight making readings impossible.

But that didn't stop the crew. "Theodolite readings are clear and steady on overcast or cloudy days and at night if the weather is right," Herrington explained.

To solve the problem the surveyors modified their equipment so they could work at night. They connected a wire to a 12-volt portable battery to power a 25-watt bulb. They added a household rheostat halfway along the cord to control brightness and mounted the light bulb behind the target.

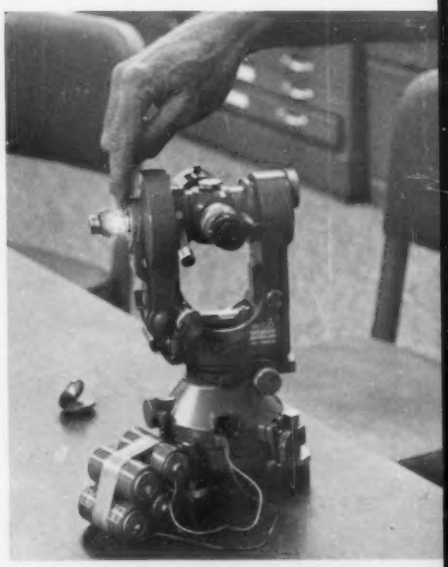
An orange-yellow cellophane filter taped across the light eliminated blurring and let enough light through so hash marks on the target could be seen and sighting edges were sharp.

A power pack of four 1.5-volt batteries connected in series and wired to bulbs in the theodolite illuminated internal verniers and crosshairs.

Thus equipped, the crew returned to survey sites after sundown. They established safety procedures including wearing reflective clothing and using emergency lights to alert motorists of their presence. The work progressed faster and with fewer interruptions than in daylight.

The total cost for adapting the theodolite-EDM to night use was less than $20.

Ms. Laber is public information officer, SCS, Orono, Maine.



Modifications to the survey equipment include a 25-watt bulb, connected to a power pack of four 1.5-volt batteries (below left), which reflects off amber-colored material that was added to a pair of targets (below).

Civil Engineering Technician Ray Herrington (above) checks theodolite during nighttime survey. At left, Ray Herrington and Engineering Technician Parker Rand (right) adjust theodolite for daytime use.

John Pierson, 4–H delegate from East Hanover, N.J., and Kathy Robichard from Lake Charles, La., observe a pond built for wildlife on the Izaak Walton League farm.

by Shirley Foster Fields

Wildlife Conservation: A New 4–H Emphasis

How can a farmer make his land appealing to wildlife without great expenditures of effort or money? Teenage 4–H members from 27 States learned the answer to this question during the 4–H National Wildlife Conservation Workshop in Washington, D.C.

The week-long conference—held last fall as part of a new nationwide 4–H emphasis on wildlife conservation—was the first of its kind in the organization's history.

The members took part in discussions led by nationally known authorities from government and private organizations engaged in all phases of wildlife conservation. They also participated in field trips which gave them an opportunity to observe conservation problems and solutions on the land.

A highlight of the conference was a field trip to a 365-acre Montgomery County, Md., farm owned by the Bethesda-Chevy Chase Chapter of the Izaak Walton League of America. A conservation plan developed in cooperation with the Montgomery County Soil Conservation District has been used in managing the farm since 1941.

Wildlife conservation is of primary importance at the Izaak Walton acreage. The 4–H members walked over fields and woodlands and observed farm ponds and wildlife plantings that attract waterfowl, large numbers of songbirds, and field and woodland animals.

"Not much extra work and relatively little extra money is needed to make farmlands appealing to wildlife," Soil Conservation Service Soil Conservationist Richard Brush told the group.

Brush pointed to field plantings of autumn olive, sunflowers, millet, and corn that provide the farm's wildlife with food and cover. The members also observed woodland plantings of hickory, oak, and black walnut trees.

Wood ducks, turtles, frogs, and green heron thrive at the League's two farm ponds. In the fields and woodlands, wildlife enthusiasts find rabbits, squirrels, field mice, doves, pheasants, and quail. Songbirds abound as do deer and raccoons.

Other excursions by the members included visits to the Remington Farm in Chestertown, Md., and the National Zoo in Washington, D.C. At National 4–H Headquarters in Washington, representatives from USDA's Forest Service, Environmental Protection Agency, Bureau of Land Management, Sierra Club, and National Wildlife Federation addressed the group on wildlife habitat management.

An all-day session on land-use planning featured talks by representatives from the Senate Energy and Natural Resources Committee; Office of Coastal Zone Management; Office of Comprehensive Planning, Fairfax County, Va.; and the U.S. Fish and Wildlife Service.

M. Rupert Cutler, Assistant Secretary of Agriculture for Conservation, Research, and Education, spoke to the delegates, pointing out that farmers and ranchers in 3,000 local conservation districts throughout the Nation are installing conservation practices and establishing land-use patterns that enhance wildlife cover.

"Through these local conservation districts, USDA agencies help people with wildlife and resource management," Cutler said. Among the practices that help wildlife are terraces; contour farming; stripcropping; grassed waterways; windbreaks; crop rotation; improved pastures, rangeland and woodland; and tree planting, Cutler noted.

Not only do these conservation practices improve wildlife habitat on the land, Cutler said, they also control soil erosion and reduce sedimentation. This means less movement of fertilizers and chemicals so the habitat of fish and other aquatic life is protected.

Ms. Fields is a public information officer, Information Division, SCS, Washington, D.C.

Award Winning Future Farmers

In national competition, Minnesota youths win double honors for good farm business methods and community leadership.

FFA top awards went to Dwight Buller (left) as Star Farmer of America, and Michael Deming (right), Star Agribusinessman of America. James Bode (center), National FFA president, made the presentations.

Star Farmer of America was the title awarded Dwight Buller of Hendricks, Minn., at the 50th anniversary convention of the Future Farmers of America (FFA). Along with the title, 21-year-old FFA member Buller received a $1,000 check.

At the convention in Kansas City in November 1977, another young Minnesotan, Michael Deming of Claremont, won the equally prestigious national FFA award—Star Agribusinessman of America. Deming also received a $1,000 check. This is the first time that both top FFA honors went to FFA members from the same State.

Star Farmer Buller made his commitment to farming at age 12 when his father's health began to fail. By the time he was a senior in high school, young Buller was handling his family's cattle feeding operation. Just before graduation from high school, he bought the home farm on contract from his parents and that year farmed 500 acres of rented and owned land.

At age 18, he borrowed money to buy equipment and supplies and contracted with neighbors to do custom fieldwork. Increases in the size of his operation since 1975 resulted in his farming 1,600 acres and doing custom fieldwork on an additional 1,200 acres last year.

In selecting the Star Farmer, judges base their decisions on candidates' management practices, return on investment, and overall knowledge and use of good farm business methods as well as leadership in FFA.

Star Agribusinessman Deming, age 21, owns and operates a materials handling dealership in Owatonna. He got an early start when his former employer was incapacitated by a serious back injury in 1974 and sold the dealership to the then 18-year-old Deming.

With backing from his father and a bank loan, Deming has broadened his operations to provide a variety of equipment services for farmers. His wife, a partner in the business, relays calls over the citizen's band radio to keep Deming in touch with customers and his work crews in the three-county area he covers.

In his letters of congratulations to Buller and Deming, Agriculture Secretary Bob Bergland complimented the young men on their industry, initiative, and skill and stated, "I admire the leadership you have demonstrated in school and community activities."

Buller and Deming competed with other regional winners for top FFA honors. Star Farmer regional winners included Dirk Webb, Elk City, Okla.; Earl Hamilton, Springboro, Pa.; and Ronald Jones, Brighton, Tenn. Competing for the Star Agribusinessman award were Anthony Thomason, Toccoa, Ga.; Brian Duffy, Green Springs, Ohio; and Gary D. Roberson, Olympia, Wash.

FFA is a national organization of students of vocational agriculture in public secondary schools. It has more than a half million members in chapters in the United States, Guam, Puerto Rico, and the Virgin Islands. More than 22,000 students and their vocational agriculture instructors attended the 50th anniversary convention in Kansas City.

Among other national awards presented at the FFA convention, an important one was the proficiency award in soil and water management. The winner of the $500 award was Michael Estock of Louisville, Ohio. Estock's parents were not farmers, so he gained his experience and skill by working throughout his high school career for a farm owner.

With help from the local Soil Conservation Service office, Estock developed and implemented a farm conservation plan under which he installed such practices as crop rotation, plowing and cultivating on the contour, minimum tillage, tiling, windbreaks, and grassed waterways. He also built and maintained two farm ponds and constructed drop inlet boxes of concrete.

Estock plans to earn a degree at Ohio State University and become a farm manager. "Regardless of how good you are at farming," he said, "without proper management of soil and water, your land and its resources will be lost or laid waste by poor management."

Regional winners against whom Estock competed were James Beers, Putnam, Okla.; Paul Main, Six Lakes, Mich.; and Roger Johnson, Perkins, Ga.

New Publications

Land Use: Tough Choices in Today's World

by the Soil Conservation Society of America

The proceedings of the 1977 national symposium on land use are presented in this 454-page publication. The 53 papers were given at the symposium by planners; natural resource specialists; attorneys; Federal, State, and local government officials; landowners; and others.

The papers are grouped into seven sections. The first section, Facing the Tough Choices, contains articles such as "National Land Use Planning: A Legislative Agenda" and "Programs to Help People Make Land Use Choices." The second section, Competition for Land, has papers about the demand for food and fiber, for living space, and for natural space.

Section 3, Land for Food and Fiber, addresses the agricultural issues involved with land use planning. Several papers in this section deal with specific approaches in various States such as New York, California, New Jersey, and Iowa.

The next three sections are about providing land for living space, setting aside land for natural space, and Federal and State involvement in land use planning.

Finally, a special section is included on the role of planners and developers, citizens, elected officials, farmers, attorneys, landowners, and the courts.

The book is available from the Soil Conservation Society of America, 7515 Northeast Ankeny Road, Ankeny, Iowa 50021. Single copies are $7; 10 or more copies are $6 each. (Order Special Publication No. 22.)

National Forest Landscape Management Volume 2, Chapter 3, Range

by USDA's Forest Service

Fourth in a series of publications about visual resources, this chapter provides landscape management guidelines as applied to range vegetation control and range structures.

The section on objectives introduces the publication with the statement that "the *visual landscape* is now considered a basic resource, to be 'treated as an essential part of and receive equal consideration with the other basic resources of the land.' " As an aid to understanding why range management is necessary, the publication then recounts the historical impact of the invasion of brush on U.S. grazing land. It continues with three basic concepts to be considered in evaluating the visual impact of range management practices: characteristic landscape, variety, and deviations.

These concepts are followed by a section on dominance elements. Each of the four elements—form, line, color, and texture—is shown in color photographs.

The publication also has sections on the collection and use of basic planning data and on design guidelines which include considering wildlife requirements and the impact of access roads.

The section on vegetative control measures presents three methods for removing undesirable vegetation: mechanical treatment, chemical treatment, and prescribed burning. The final section is on range structures which are discussed in three categories: fences, corrals and related structures, and water developments.

The publication is illustrated with full-color photographs and art. A list of selected references is given along with the other publications in the series on National Forest Landscape Management.

The publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Single copies are $1.70 and a 25 percent discount is given on orders of 100 or more copies. (Agricultural Handbook No. 484, Stock No. 001–000–03578–9.)

Conservation Tillage for Wheat in the Great Plains

by the U.S. Department of Agriculture, Cooperative Extension Service

This 32-page publication covers the need for conservation tillage, the planting of wheat, and the control of erosion, weeds, diseases, and insects. It is aimed at helping farmers produce wheat and save water, soil, and energy at the same time.

Minimum tillage, no-till, and chemical fallow are some of the terms defined in a brief glossary at the front of the publication. Illustrations include photos, tables, and maps. There are two lists of references: papers prepared specifically for the publication and general references.

"Conservation Tillage for Wheat in the Great Plains" was prepared in cooperation with the Wheat Industry Resource Committee and the National Association of Wheat Growers.

PA–1190 is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Copies are $1.30 each. There is a 25 percent discount on orders of 100 or more copies.

Conservation Plants for the Northeast

by the Soil Conservation Service

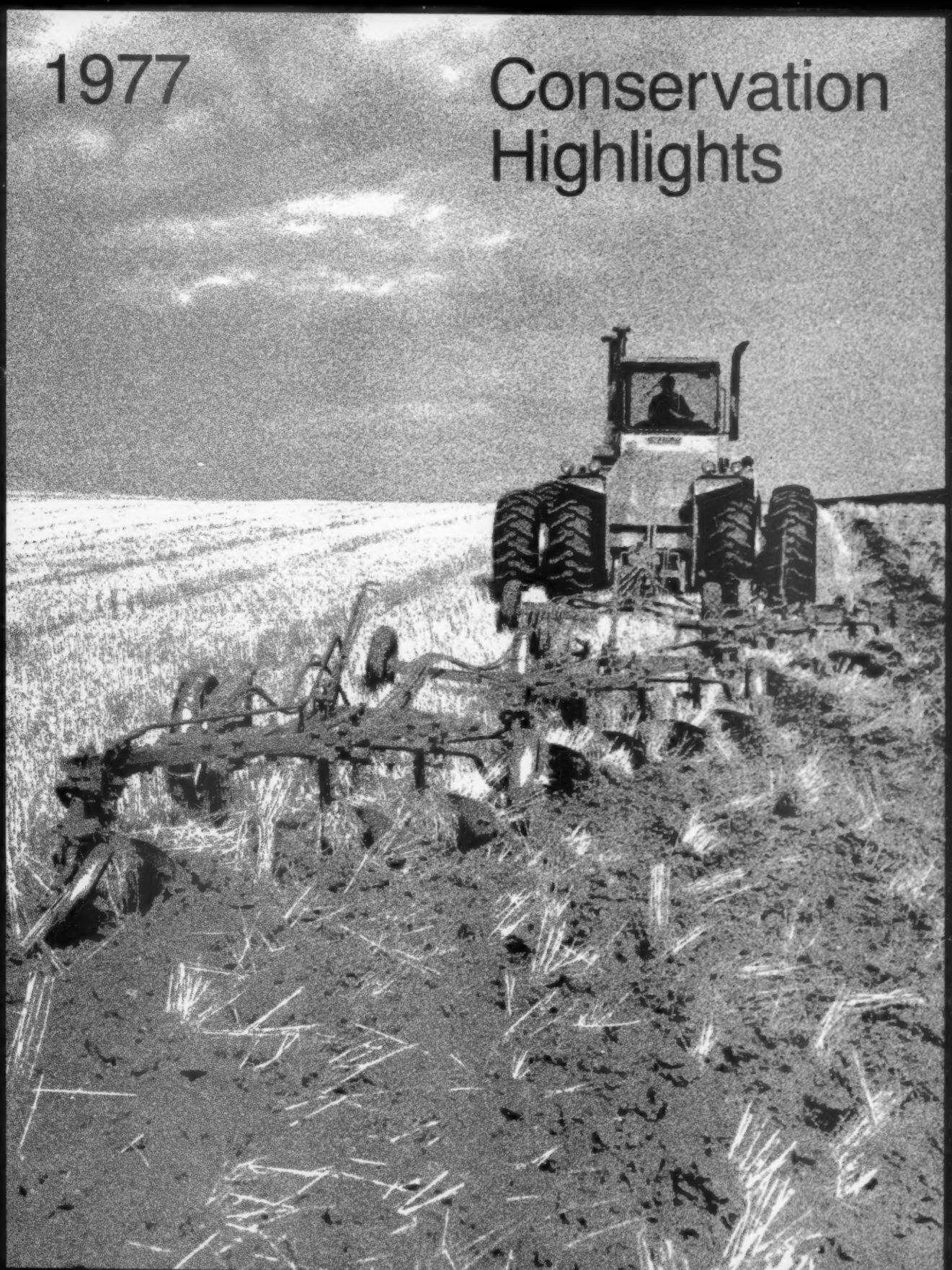
This booklet describes plants suited to specific conservation uses under different site conditions in the northeastern United States.

The plants are grouped according to their main conservation use into five categories: plants for disturbed areas; ornamental ground covers; plants for coastal dunes and sandy inland areas; wildlife food and cover plants; and plants for screens, hedges, and windbreaks.

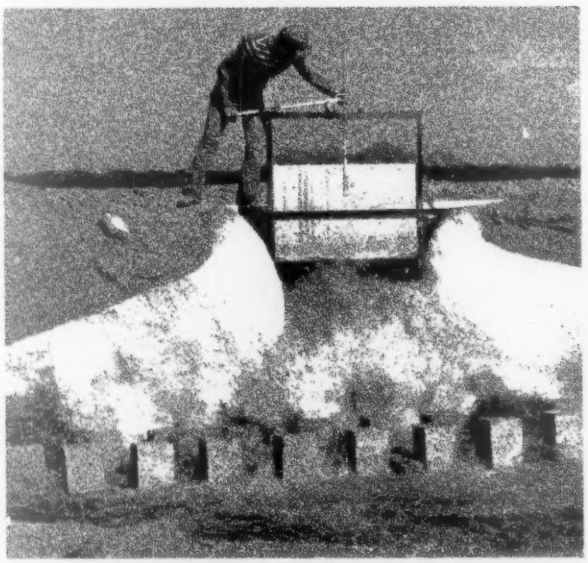
Sixty plants are included along with information on areas of climatic adaptation, conservation uses, growth rate, and site conditions under which the plants can grow. The booklet also has a section on how to establish plants.

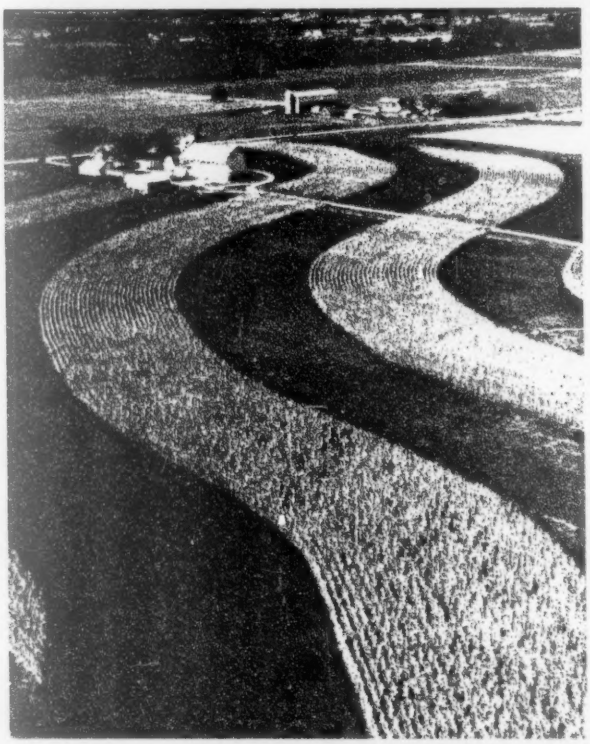
The full-color publication is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Single copies are $1.70. (Stock No. 001–000–03605–0.)

1977 Conservation Highlights



Summary of Activities of the Soil Conservation Service for Fiscal Year 1977





Drought, rising farm expenses—including energy costs—and other factors in 1977 renewed farmer and rancher interest in soil and water conservation.

During fiscal year 1977, 73,000 farmers and ranchers signed cooperative agreements on more than 28 million acres.

The Soil Conservation Service (SCS) of the U.S. Department of Agriculture (USDA) helped them use minimum tillage, for example, on 3.9 million more acres of cropland in fiscal year 1977. The practice conserves soil moisture and saves fuel by reducing the number of tillage trips across the field. It also reduces soil erosion by as much as 95 percent.

Use of stripcropping and field windbreaks also increased during the year, reversing about a 5-year downward trend. Cooperators stripcropped more than 455,000 acres and planted more than 2,900 miles of field windbreaks.

To make the best use of available water and to protect the soil, district cooperators installed 14,474 irrigation systems on almost 1.5 million acres.

With the increasing awareness of forestry values, land users sought SCS assistance in planting nearly 380,000 acres of trees.

SCS technicians helped prepare more than 56,000 conservation plans covering almost 24 million acres in fiscal year 1977. They also provided onsite assistance to farmers, ranchers, and other land users to make sure that conservation practices were properly designed, installed, and maintained. SCS provided more than 2.7 million technical services. SCS also helped some 934,000 individual landowners and groups of land users—such as neighboring landowners or community organizations—with conservation plans and related services.

Adequately treated land, or land on which conservation practices were planned and applied during 1977 with SCS assistance, totals 39,827,560 acres.

Conservation Help for Units of Government

SCS employees furnished more than 106,000 services to 25,576 local and State governments during the year. SCS provided basic soil and water data used by local governments in preparing regulations concerning land use and control of sediment and erosion. SCS also helped prepare more than 14,000 natural resource inventories and evaluations. Local governments use these to develop quality standards for conservation land use and treatment.

Soil Surveys

SCS leads the National Cooperative Soil Survey. As of September 30, 1977, more than 1.4 billion acres in the United States, Puerto Rico, and the Virgin Islands had been mapped to show the location and kind of soil. More than 57 million acres were mapped during fiscal year 1977.

A record 110 soil survey manuscripts and maps were submitted for printing during the year, and 91 surveys were published. At the end of the year, SCS had 1,067 modern published soil surveys covering 515 million acres.

Snow Surveys
In the West, SCS snow surveyors measure the mountain snowpack in winter to estimate how much water will be available for many uses in spring and summer. In fiscal year 1977, snow surveyors took nearly 20,000 measurements of snow, precipitation, temperature, and soil moisture and issued 3,533 water supply forecasts.

Progress in automation continued during the year. Remote sensing equipment was installed at 100 data sites, making a total of 360 automated sites. The meteor burst communications system contractor installed communication equipment at 160 sites and is expected to begin final testing of the system early in 1978.

Emergency Assistance
Under Section 216 of the Flood Control Act of 1950, more than $12 million was obligated for emergency streambank stabilization, debris removal, and revegetation to protect life and property after storms and floods caused damage in 13 States.

SCS provided technical assistance to farmers, ranchers, and local governments in 2,108 counties designated as emergency drought areas in 36 States, Puerto Rico, and the Virgin Islands.

Small Watershed Projects
Small watershed projects under Public Law 566 combine conservation measures on private and public lands with dams and other structural measures to reduce floods and provide water supply, recreation, and wildlife habitat. During fiscal year 1977, 24 small watershed projects were completed, bringing to 450 the number completed since the program began in 1954.

River Basin Studies
Through the River Basin Program, SCS has USDA leadership for water and related land resource planning assistance to Federal, State, and local governments. SCS also leads USDA participation in Water Resources Council interagency studies.

Colorado River Basin Salinity Control Program
Under Public Law 93–320, SCS is cooperating with the Bureau of Reclamation of the U.S. Department of the Interior to reduce salt concentrations in the Colorado River, primarily by improving onfarm irrigation efficiency. Under the Title I program, the major practices installed include land leveling, concrete-lined irrigation ditches, and structures for water control and measurement. Title II salinity control studies were going on in five areas covering some 540,000 acres of irrigated land and thousands of dryland acres.

Environmental Services
SCS filed 17 draft and 10 final environmental impact statements with the Council on Environmental Quality during fiscal year 1977. The agency also commented on 761 environmental impact statements from other agencies and cooperated in numerous environmental assessments throughout the Nation.

Flood Plain Management
SCS completed 69 flood hazard studies in 28 States during fiscal year 1977. Through the studies, SCS provides information on managing flood plains to local governments and provides information needed by the U.S. Department of Housing and Urban Development in determining flood insurance rates.

National Water Assessment
SCS continued to participate in the Water Resources Council's second national water assessment. SCS provided data on existing use and projected water needs for livestock, irrigation, and self-supplied domestic water systems for the years 1985 and 2000. SCS also supplied data on existing and projected upstream flood damages and cropland erosion rates.

Wildlife
SCS specialists helped landowners improve 13.2 million acres of land and water for wildlife during the year. They helped landowners convert more than 336,000 acres from other uses to wildlife and recreation areas. Other conservation measures, including the 45,000 ponds SCS designed during the year, also benefit wildlife.

SCS helped landowners involved in aquaculture by providing technical assistance on 4,400 acres of commercial fish ponds.

Water Bank Program
Through the Water Bank Program, SCS provides technical assistance for conserving wetlands in migratory waterfowl nesting and breeding areas. During fiscal year 1977, SCS assisted land users in preparing 758 conservation plans that support Water Bank agreements. A total of 4,202 plans covering 430,112 acres have been developed or revised for Water Bank agreements since the program was established in 1972.

Recreation
SCS provided technical and financial assistance for establishing or expanding 686 public recreation developments, which included parks run by State, county, and local governments. SCS specialists also provided technical assistance to more than 12,000 private landowners in developing commercial and noncommercial recreation facilities.

Plant Materials
Seven new conservation plant varieties were released in fiscal year 1977 by SCS and other agencies. Among the released varieties were plants for use in reclaiming surface-mined land in the West, converting marginal cropland to grass, and improving rangeland and pastureland. Three of the released plants—'Zorro' annual fescue, 'Corto' Australian saltbush, and 'Kalo' dwarf English trefoil—help protect critically eroding areas. More than 130 kinds of improved plants selected or developed by SCS are now produced commercially. Commercial production of the plants during fiscal year 1977 included over 13 million pounds of seed, 8 million seedlings, and millions of vegetative cuttings and shoots for transplanting.

Woodlands and Windbreaks
With SCS technical assistance, landowners planted nearly 380,000 acres of trees, more than 23,000 acres of farmstead and feedlot windbreaks, and more than 2,900 miles of field windbreaks. They also renovated 27,177 acres of existing windbreaks. Landowners prepared 222,415 acres for planting or seeding forest crops. Improved harvesting was practiced on 952,000 more acres in fiscal year 1977, for a total of almost 39 million acres nationwide.

Pasture and Range Conservation
SCS helped farmers and ranchers with pasture and hayland plantings on almost 1.9 million acres during the year. They also helped ranchers reseed more than 344,000 acres of range, for a cumulative total of 17.4 million acres.

SCS professionals assisted ranchers with 2.5 million acres of brush management. An increasing number of ranchers are using patterns of brush management that benefit livestock and provide food and cover for wildlife. SCS also helped ranchers develop planned grazing systems for 7.8 million acres, bringing the total acreage under the system to almost 77 million.

Great Plains Conservation Program
During the year, 1,904 farmers and ranchers signed long-term contracts to apply permanent conservation measures on 4.5 million acres. Since the program began in 1956, more than 54,000 farmers and ranchers have signed Great Plains Conservation Program contracts covering 99 million acres.

Resource Conservation and Development Areas
Through Resource Conservation and Development (RC&D) areas, SCS provides technical and financial help to local units of government for improving land and water resources. RC&D areas are sponsored by conservation districts, county and town governments, and local and State agencies. The program goal is to improve the economy, environment, and living standards in RC&D areas.

During fiscal year 1977, 10 new RC&D areas in 10 States were authorized for assistance, bringing the total number of RC&D areas to 178. The program involves 1,196 counties in all States except Alaska.

Agricultural Conservation Program
SCS assisted farmers and ranchers in preparing 540 conservation plans that serve as foundations for long-term Agricultural Conservation Program (ACP) agreements. The agreements, which run as long as 10 years, provide cost sharing on selected conservation practices. This year's plans cover 696,266 acres, bringing the cumulative total to 4.9 million acres. SCS serviced 187,909 ACP referrals in fiscal year 1977.

Summary of Progress Fiscal Year 1977

Reportable progress in soil and water conservation programs assisted by the Soil Conservation Service

Metric Conversions

To assist readers, information in the tables is given in metric and in units of common measure. A hectare is equal to 2.471 acres; a kilometer is equal to 0.6214 mile.

Progress Item		Fiscal Year 1977	Cumulative to Sept. 30, 1977
Conservation Plans and Related Services			
District cooperators	No.	72,910	2,207,700
	acres	28,093,543	780,672,604
	hectares	11,369,457	315,938,203
Services to land users	No.	2,710,443	—
Individuals and groups assisted	No.	934,005	—
Individuals and groups applying practices	No.	458,476	—
Conservation plans	No.	56,415	1,758,701
	acres	23,944,780	608,465,374
	hectares	9,690,452	246,245,937
Conservation plans revised	No.	23,995	—
	acres	17,631,991	—
	hectares	7,135,667	—
Inventories and evaluations	No.	90,445	—
Federal land units in coordinated conservation plans	No.	102	1,309
Federal lands in coordinated conservation plans	acres	756,495	14,632,049
	hectares	306,154	5,921,590
Conservation Help for Units of Government			
Technical services for area planning	No.	106,359	—
Land use and treatment site plan reviews	No.	20,746	—
Agencies assisted	No.	25,576	—
Resource plans	No.	647	—
Inventories and evaluations	No.	14,418	—
Snow Surveys and Water Supply Forecasting			
Hydrometeorological measurements	No.	19,435	—
Snow survey and water supply forecasts	No.	3,533	—
Resource Surveys			
Resource studies	No.	2,701	2,703
Resource reports	No.	443	443
Great Plains Contracts			
Applications received	No.	2,610	58,866
	acres	6,696,455	113,610,613
	hectares	2,710,055	45,978,215
Contracts signed	No.	1,904	54,140
	acres	4,495,828	99,413,881
	hectares	1,819,462	40,232,798
Contracts terminated	No.	235	3,333
	acres	307,236	3,786,445
	hectares	124,338	1,532,374
Contracts completed	No.	2,493	36,901
	acres	3,902,146	65,579,632
	hectares	1,579,198	26,540,077
Unserviced applications on hand	No.	4,726	—
Agricultural Conservation Program			
ACP referrals serviced	No.	187,909	—
Conservation plans for long-term ACP agreements	No.	540	8,631
	acres	696,266	4,878,352
	hectares	281,779	1,974,269
Soil Surveys			
Soil surveys	acres	57,529,907	1,403,049,106
	hectares	23,282,353	567,813,973
Recreation Developments Established			
Private	No.	12,367	429,396
Public	No.	686	73,748
Public Law-566 Watershed Projects			
Applications	No.	12	2,846
Authorized for planning	No.	33	1,769
Approved for construction	No.	2	1,186
Construction starts	No.	16	961
Projects completed	No.	24	450
River Basin Studies			
Initiated	No.	16	145
Completed	No.	11	83
Flood Hazard Studies			
Flood hazard analyses	No.	33	121
Flood insurance studies	No.	36	191
Colorado River Basin Salinity Control Program			
Applications received	No.	48	169
Contracts signed	No.	34	64
	acres	4,827	9,730
	hectares	1,953	3,938
Contracts—structural measures completed	No.	20	31
	acres	3,374	4,933
	hectares	1,365	1,996
Resource Conservation and Development Areas			
Applications on hand	No.	—	62
	acres	—	268,576,000
	hectares	—	108,692,707
Areas authorized for assistance	No.	10	178
	acres	—	754,480,000
	hectares	—	305,338,056

Progress Item		Fiscal Year 1977	Cumulative to Sept. 30, 1977
RC&D area plans accepted	No.	—	158
	acres	—	668,592,000
	hectares	—	270,579,182
RC&D measures completed	No.	1,862	12,075
Water Bank Program			
Contracts developed	No.	758	4,202
	acres	111,342	430,112
	hectares	45,060	174,066

Practice		Fiscal Year 1977	On the land—Sept. 30, 1977
Agricultural waste management systems	No.	2,075	20,566
Brush management	acres	2,581,714	59,047,738
	hectares	1,044,819	23,896,620
Critical area planting	acres	133,003	5,748,767
	hectares	53,826	2,326,526
Farmstead and feedlot windbreaks	acres	23,601	829,238
	hectares	9,551	335,593
Field windbreaks	miles	2,945	108,470
	kilometers	4,740	174,566
Fishponds, commercial	acres	4,442	114,327
	hectares	1,798	46,268
Fishpond management	No.	37,923	821,022
Grassed waterways or outlets	acres	75,833	2,267,996
	hectares	30,689	917,858
Irrigation systems	No.	14,474	376,862
	acres	1,423,228	38,153,250
	hectares	575,980	15,440,620
Irrigation water conveyances	miles	8,554	262,016
	kilometers	13,776	421,675
Irrigation water management	acres	2,462,930	26,605,090
	hectares	996,748	10,767,080
Minimum tillage	acres	3,856,308	47,456,720
	hectares	1,560,647	19,205,735
Pasture and hayland plantings	acres	1,886,806	74,854,948
	hectares	763,590	30,293,797
Planned grazing systems	acres	7,762,655	76,542,551
	hectares	3,141,546	30,976,770
Ponds	No.	45,147	2,186,934
Proper woodland grazing	acres	1,452,831	21,240,308
	hectares	587,961	8,595,953
Range seeding	acres	344,484	17,391,454
	hectares	139,413	7,038,321

Practice		Fiscal Year 1977	On the land—Sept. 30, 1977
Reclamation of surface-mined land	acres	33,663	[1]1,894,988
	hectares	13,623	[1]766,902
Stripcropping	acres	456,643	22,184,159
	hectares	184,803	8,977,929
Subsurface drainage	miles	28,774	1,053,816
	kilometers	46,308	1,695,953
Surface drainage	miles	7,532	393,502
	kilometers	12,122	633,280
Terraces	miles	20,927	1,251,184
	kilometers	33,678	2,013,586
Tree planting	acres	379,570	25,059,625
	hectares	153,612	10,141,630
Wildlife upland habitat management	acres	12,571,704	111,066,407
	hectares	5,087,768	44,948,575
Wildlife wetland habitat management	acres	610,497	10,022,077
	hectares	247,068	4,055,935
Windbreak renovation	acres	27,177	143,339
	hectares	10,999	58,009
Woodland, improved harvesting	acres	952,002	38,645,951
	hectares	385,275	15,640,016
Woodland improvement	acres	298,852	19,141,737
	hectares	120,945	7,746,661
Woodland site preparation	acres	222,415	7,941,759
	hectares	90,011	3,214,030
Land Treated for Erosion			
Land adequately treated	acres	39,827,560	—
	hectares	16,118,212	—

Land Use Conversions		SCS-assisted conversions Fiscal Year 1977	Estimate of all conversions Fiscal Year 1977
Cropland to grassland	acres	547,082	8,948,592
	hectares	221,404	3,621,495
Cropland to woodland	acres	50,152	918,458
	hectares	20,297	371,700
Cropland to other uses	acres	88,956	3,026,695
	hectares	36,000	1,224,903
Grassland to cropland	acres	590,786	4,875,777
	hectares	239,091	1,973,227
Any use to wildlife-recreation land	acres	336,228	3,731,389
	hectares	136,071	1,510,093
Woodland to cropland	acres	117,280	819,781
	hectares	47,463	331,765
Woodland to other uses	acres	73,091	1,134,731
	hectares	29,580	459,226

[1] From an SCS inventory, *Status of Land Disturbed by Surface Mining in the United States as of July 1, 1977.*

Reviews

Farm Machinery and Equipment
Harris Pearson Smith and Lambert Henry Wilkes. 1976. Sixth edition. McGraw-Hill Book Company, New York. 488 pp., illus. $18.50.

This publication is designed for use in the classroom and as a reference book on farm equipment and machinery.

It describes equipment for applying insecticides, herbicides, and fungicides; equipment for harvesting cotton, corn, small grains, and other crops; and crop-processing and labor-saving equipment.

Chapters on lubricants and lubrication, rubber tires for farm equipment, transmission of power, selection of farm machinery, the economics and management of farm equipment, and other informative chapters make it a useful guide to the use and maintenance of modern farm machinery.

Many black and white photos, line drawings, diagrams, tables, and charts illustrate the text. A list of references and a list of questions and problems that can be used for class discussions or assignments follow each chapter.

The authors also provide an appendix with tables that give: equivalents for acres, bushels, meters, watts, etc.; the multiplication factor for converting acres to hectares, square feet to square meters, etc.; draft and power requirements of crop machines; historical dates in the development of farm equipment in the United States; the miles per hour for different tire sizes; the distance traveled in tilling an acre of land with various widths of cut; the multiplication factor for converting pounds per row to pounds per acre; and other information.

"Farm Machinery and Equipment" is comprehensive and up-to-date. It would be especially helpful to agricultural students and those entering careers in agriculture.

—Gerald M. Darby, staff agronomist, SCS, Washington, D.C.

Meetings:

March	
12–16	American Concrete Pipe Association, Atlanta, Ga.
17–19	National Wildlife Federation, Phoenix, Ariz.
19–22	North American Wildlife and Natural Resources, Phoenix, Ariz.
22–23	Air Pollution Control Association Government Affairs Seminar, Washington, D.C.
April	
4–6	Garden Club of America, Birmingham, Ala.
5–7	Engineering Geology and Soils Engineering Symposium, Boise, Idaho
9–11	American Pulpwood Association, Atlanta, Ga.
9–12	Association of American Geographers, New Orleans, La.
17–21	American Geophysical Union, Washington, D.C.
19–21	Air Pollution Control Association, Conference on Methodology for the Assessment of Air Pollution Effects on Vegetation, Minneapolis, Minn.
19–21	Hardwood Plywood Manufacturers Association, Panama City, Fla.
24–26	National Academy of Sciences, Washington, D.C.
29–May 4	American Society of Planning Officials, Indianapolis, Ind.
30–May 2	Chamber of Commerce of the United States, Washington, D.C.
May	
1–5	League of Women Voters, Cincinnati, Ohio
6–7	Sierra Club, San Francisco, Calif.
6–9	National Forest Products Association, Washington, D.C.
17–19	Boy Scouts of America, Phoenix, Ariz.

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